Rinorea belalongii (Violaceae), a New Species from Borneo

P. F. Stevens

Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299, U.S.A., and
University of Missouri at St. Louis, Department of Biology, 8001 Natural Bridge Road,
St. Louis, Missouri 63121, U.S.A.

ABSTRACT. *Rinorea belalongii*, from dipterocarp forests in Brunei and probably also Sabah, is described and illustrated. It is distinct in its very long and sharply acuminate leaf blades, cauliflorous and ramiflorous inflorescences, stamens lacking ventral appendages, and gynoecium with densely short-puberulent ovaries and glabrous, expanded styles that are constricted just above the hairy bases.

Rinorea (Violaceae) is represented in Malesia by 14 species of mostly rather small trees. In the course of disentangling the complex variation pattern of *Rinorea longiracemosa* (Kurz) Craib, a species that appeared to range from Burma and Vietnam to Borneo (Jarvie & Stevens, 1998), a group of specimens from Brunei that probably represented an undescribed species was noted. Initially identified as *R. longiracemosa* (Kurz) Craib (Forman & Ahmad, 1996), flowering material of this taxon has since been collected, and it is described as *R. belalongii*. Whether or not *R. belalongii*, as well as the other taxa previously included in *R. longiracemosa*, are in fact particularly close to the latter remains to be seen. Since the flowers of *R. belalongii* are perhaps the most distinctive of those of any Malesian species, this suggests that it is not immediately related.

Rinorea belalongii P. F. Stevens, sp. nov. TYPE: Brunei Darussalam. Temburong District, Kuala Belalong Field Studies Centre, 85 m, 1 Mar. 1999, *Hemingway & Malcomber 130* (holotype, MO; isotypes, K, SAR). Figure 1.

A speciebus aliis *Rinoreae* in laminis in siccitate viride-vel flavido-brunneis et acuminibus longis usque ad 4.5 cm longis praeditis, inflorescentiis brevibus paucifloribus, antheris subglabris appendiculis ventralibus nullis, stylis base pilis densis brevibus praeditis tum constrictis tum demum inflatis, et ovariis fructibusve pilis densis brevibus praeditis, differt.

Shrub or small tree 1–3 m tall, DBH to 2 cm. Bark pale brown with lenticels. Twigs 1.3–1.8 mm across, glabrous or with sparse hairs; internodes (2–)3–7.5 cm long. Leaves distichous, minutely puberulent and with sparse adpressed brown hairs, or glabrous; stipules (3–)3–7.5 × 1–1.3 mm, striate, deciduous; petiole 1.5–4.5(–8) × 1.5–2 mm; lamina subovate-oblong, 15.2–ca. 38 × 4–9.8 cm, apex gradually and sharply acuminate, acumen to 4.5 cm long, base rounded to subcordate, ± asymmetrical, margin serrulate, 5 to 9 serrations/5 cm, texture chartaceous, surface drying greenish to yellowish brown, with sparse adpressed brown hairs on midrib below, very few on abaxial surface, or glabrous, venation eucamptodromous to brochidodromous, the latter on smaller leaves and toward the apex, midrib and secondaries slightly raised above, strongly raised below, secondaries 10 to 15 (perhaps to 18)/side, 8–30 mm apart, finer venation reticulate, obscure to slightly raised above, raised below, domatia absent. Inflorescences cauliflorous and ramiflorous, several together or branched from the base, axis 6–10 mm long, with 3 to 6 flowers, minutely puberulent; bracts and bracteoles with conspicuous brownish adpressed hairs, bracts 2.5–2.7 mm long, pedicels 4–6 mm long, puberulent, articulated at or somewhat above the middle, bracteoles 1.8–2.2 mm long, ca. ⅓ up. Sepals green-white, ovate, 4.8–5.5 × ca. 4 mm, with adpressed brownish hairs abaxially; petals white, ovate, ca. 9 × 3.5 mm, apex sharply cuneate, margins with a few minute hairs; stamens 10, subglabrous, filaments ca. 2.7 mm long, connate for the basal ca. 0.7 mm, anther thecae 2–2.2 mm long, with a few hairs at the base, the abmedial lateral walls ca. 1.7 mm long, connective appendage ca. 2 × 1.8 mm, triangular; ovary ca. 3 mm long, densely puberulent, 3 ovules/placenta, style continuous, ca. 4 mm long, puberulent at the base, contracted, then expanded, stigma indistinct. Capsule subellipsoid, ca. 2 × 1.5 cm, sepals at the base usually ± spreading, surface drying yellowish, smooth to furfuraceous, pericarp splitting into two layers; seeds straw-colored, ca. 7 × 6 mm, basally with an annulus ca. 3 mm across, umbo ca. 0.8 mm across.

Distribution and ecology. Rainforest at 50–85 m altitude. Flowering in February and March, fruiting in June and August.

The only specimen from Sabah, *SAN 85186*, that

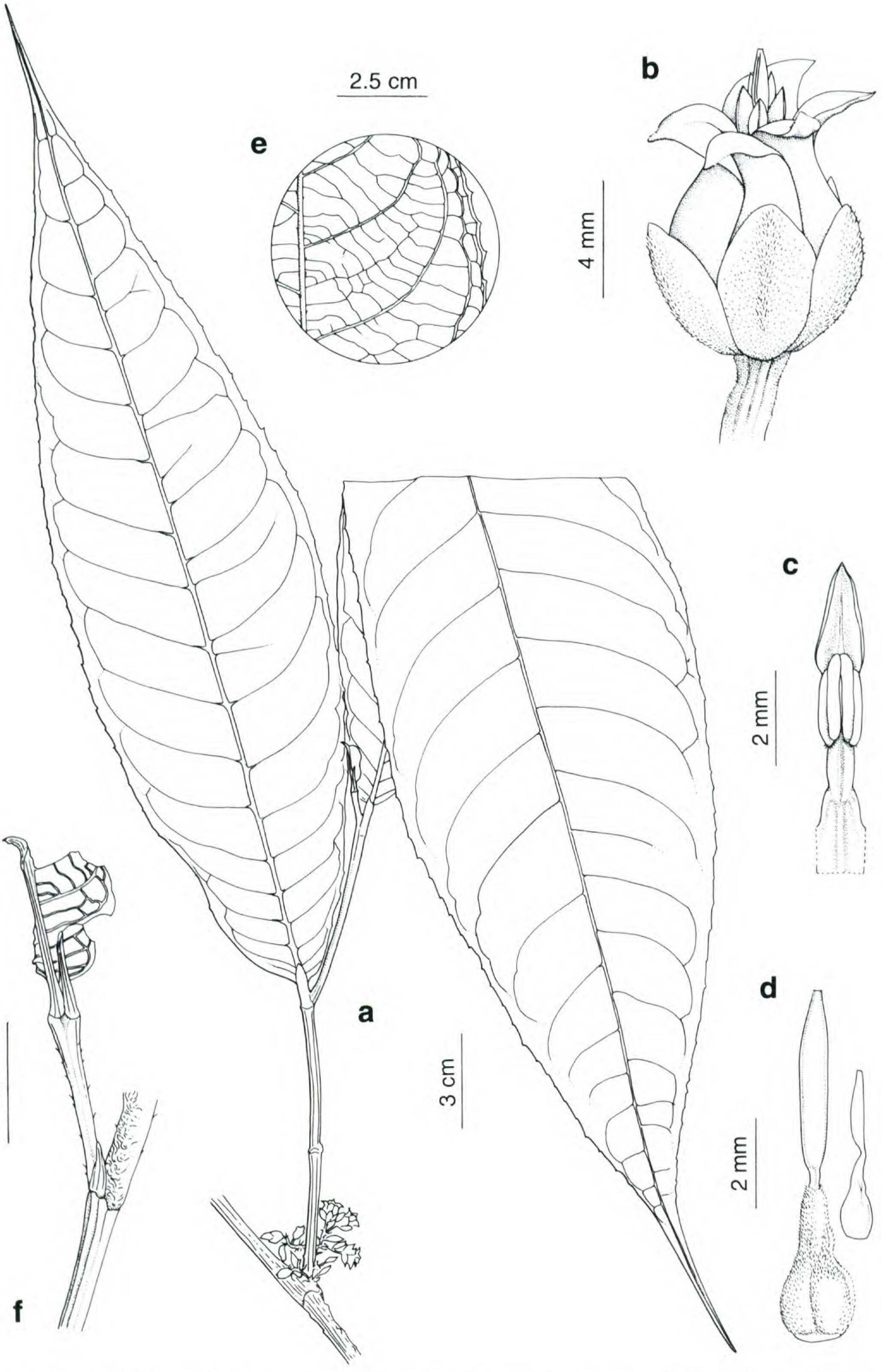

Figure 1. *Rinorea belalongii* P. F. Stevens. —a. Flowering shoot. —b. Flower. —c. Individual stamen, adaxial view. —d. Gynoecium, front and side views. —e. Details of the venation. —f. Apex of twig showing terminal bud enclosed by stipules. (From *Hemingway & Malcomber 130*, MO.)

may be assignable to this species has rather small sepals ca. 4.8 mm long (when dry) that are more or less adpressed to the capsule.

The inflorescence of *Rinorea belalongii* seems to be a reduced panicle or thyrse. The gynoecium is distinctive and quite unlike both that of any other species I have examined and also the descriptions in Jacobs and Moore (1971). The style is constricted just above the basal, hairy portion, and then considerably expands toward the apex; it later abscises at this constriction. Viewed from the side (Fig. 1D), the gynoecium appears to be monosymmetrical; however, the flower as a whole is basically polysymmetrical. Observations on living material are needed to confirm this. Although very different from the styles of other Malesian species, there is considerable variation in stylar morphology in Violaceae, including *Viola* itself, and in *Rinorea* elsewhere in its distributional range.

Rinorea belalongii may be inserted into the keys provided by Jacobs and Moore (1971) and Jarvie and Stevens (1998) as follows:

8. Inflorescences more or less elongate, or flowers few on a short (> 5 mm long) rachis; fruit 1.25–4 cm in diameter.
9. Stipules 1–3.5 mm long; inflorescences axillary, lacking basal perulae, 0.5–2.5 cm [mm in Jarvie & Stevens, 1998] long . . . . . *R. javanica* (Blume) Kuntze
9. Stipules (2–)4–21 mm long; inflorescences axillary, terminal, or terminating short shoots, with persistent basal perulae or their scars, 0.5–13 cm long.
9*. Inflorescences from defoliate axils, axis 0.6–1 cm long; anthers lacking ventral appendage, ovary densely short-puberulent . . . . . *R. belalongii*
9*. Inflorescences terminal or terminating short shoots, axis 3–13 cm long; anthers with distinct ventral appendage, ovary glabrous or with sparse hairs—see Jarvie and Stevens (1998) for the continuation of this part of the key.

Paratypes. BRUNEI. Temburong District, Sungei Temburong at Kuala Belalong, *Dransfield 6632* (A, K); S. Belalong, *K. M. Wong WKM 1165* (K); Kuala Belalong Field Studies Centre, 50 m, *Argent et al. 9135* (K). SABAH. **Lahad Datu:** Ulu Sg. Danum, near Kuala Segama, *SAN 85186* (K).

Acknowledgments. I am very grateful to Barbara Alongi for the fine illustration, to Harvey Ballard for comments, and to the directors of the herbaria cited for permission to examine their material.

Literature Cited

Forman, L. L. & J. A. Ahmad. 1996. Violaceae. P. 334 *in* M. J. E. Coode, J. Dranfield, L. L. Forman, D. W. Kirkup & I. M. Said (editors), A Checklist of the Flowering Plants and Gymnosperms of Brunei Darussalam. Ministry of Industry and Primary Resources, Brunei Darussalam.

Jacobs, M. & D. M. Moore. 1971. Violaceae. Pp. 179–212 *in* C. G. G. J. van Steenis (editor), Flora Malesiana, ser. 1, vol. 7. Wolters-Noordhoff, Groningen.

Jarvie, J. K. & P. F. Stevens. 1998. New species and notes on Violaceae and Flacourtiaceae from Indo-Malesia. Harvard Pap. Bot. 3: 253–262.